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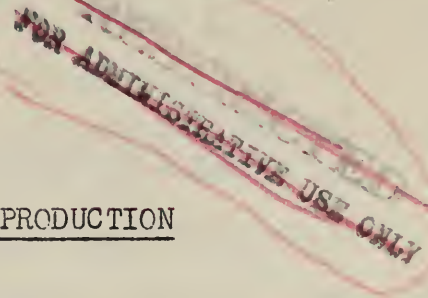
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UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
Pacific Region

Land and Water Management  
Biology Training Series #1



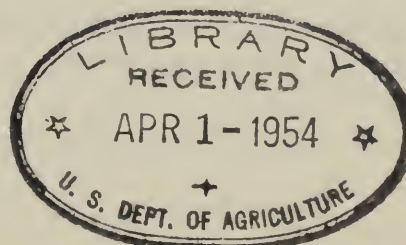
DESIGNING A FARM POND FOR FISH PRODUCTION

I. Introduction

- A. Most farm ponds constructed for irrigation water storage, livestock water facilities, and erosion or flood control are generally inadequate for the production of fish unless special attention is given to the design of ponds to be used for this purpose.
- B. Farm ponds not designed for fish production generally have one or more of the following needs:
  - 1. Erosion control on the watershed to prevent pond siltation.
  - 2. Regulation of the amount of water flowing through the ponds.
  - 3. Deeper water -- particularly at inlet and around the pond margin -- to discourage vegetative growth.
  - 4. Fertilization to increase fish food supply and control aquatic weed growth and pond scum.
  - 5. Provision for drainage of pond to permit restocking or repair.
  - 6. Outlet structures designed to prevent fish loss.
  - 7. Holding adequate water reserves for fish even when the water level in irrigation reservoirs is low.
  - 8. Fencing to exclude livestock.
- C. Standard farm pond design features that are not specifically applicable to fish production problems are not included in this training outline.

II. Important features of farm pond design for fish production:

- A. Water supply and control
- B. Size
- C. Depth
- D. Outlets



## III. Farm fish pond water supply and control.

## A. Source of water:

- |                       |                                      |
|-----------------------|--------------------------------------|
| 1. Springs            | 4. Wells                             |
| 2. Clear streams      | 5. Runoff from stabilized watersheds |
| 3. Irrigation ditches |                                      |

(Safe water for trout must be within pH range of about 6 to 8.)

## B. Flow of water through pond:

1. Constant flow may be desirable but not necessary.
2. Divert surplus water around pond.
  - (a) Headworks design
3. Pond can not be managed without full control of water.
4. Regulate flow to
  - (a) Maintain desired depths
  - (b) Maintain proper oxygen content
  - (c) Prevent solid freezing in winter
  - (e) Keep surface foot of water below these temperatures for trout -- Rainbow - 75°, German Brown - 72°-73°, Cut-throat - 70°, and Eastern Brook - 65°. Bass and bluegill need water temperatures of 70° or more for spawning.

## IV. Farm fish pond size

- A. Ponds less than 1/3 acre will not support enough fish to afford much food or sport.
- B. Ponds of less than about 5 acres can be easily managed by one landowner.
- C. Size of pond commonly determined by fish production needs:
  1. A good trout pond should produce 80 to 100 pounds of fish per acre per year.
  2. Well managed bass-bluegill ponds have produced 200-400 pounds of fish per acre per year.

## V. Depth of farm fish ponds

- A. A minimum depth of 8' (10% or more of the pond) in cold winter climates.
- B. Minimum of 6' in cool climates where little or no ice occurs.
- C. In areas of warm summer climates, trout ponds must be deep enough to maintain minimum safe temperatures below the surface.
- D. Irrigation reservoirs should not be drawn below 4' depth.
- E. Minimum depth for shoreline and any part of pond -- 3'. This is important from weed control standpoint!

## VI. Pond outlets

## A. Trickle tube

- 1. Eight inch minimum diameter vertical pipe draining into line through dam. This takes care of the small normal flow through the pond.
- 2. Trash free, escape proof screen may be installed.

## B. Emergency spillway

- 1. Needed on all ponds where full control of water flow to pond is not obtained.
- 2. Design spillway wider than necessary to prevent fish loss. Fish avoid shallow depth and slower current in the wider opening.
- 3. Do not screen the spillway!

## VII. Pond protection

- A. Exclude livestock. Fence pond and provide stock tank outside of area.
- B. Plant grasses, trees and shrubs to improve area for wildlife.

## VIII. Recommended reference reading:

## A. \_\_\_\_\_

Current. Handbook of engineering practices, Soil Conservation Service, Pacific Region.

## B. Compton, Lawrence V.

1943. Techniques of fish pond management.  
USDA Miscellaneous Publication No. 528.



VIII. Recommended reference reading (continued)

C. Davison, Verne E.

1945. Farm fish ponds for food and good land use.  
USDA Farmers' Bulletin 1983.

D.

1953. How to Build A Farm Pond for Fish Production.  
Job Sheet. SCS. Pacific Region.

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